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30 पलंग तक अस्पतालों के लिए अस्पताल सेवा में गुणता आश्वासन के लिए कार्यनिष्पादन संबंधी मार्गदर्शिका

Indian Standard

PERFORMANCE GUIDELINES FOR QUALITY ASSURANCE IN HOSPITAL SERVICES UP TO 30-BEDDED HOSPITALS

ICS 03.120.10; 11.020

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Hospital and Medical Care Services Sectional Committee had been approved by the Management and Systems Division Council.

Health and medical care delivery system in our country are coming under constantly increasing pressure due to increased utilization as a result of population explosion, increased awareness among people, biomedical advancement resulting in the use of sophisticated and advanced technology in diagnosis and therapeutics, and constantly rising expectation levels of the users of these services. Also the Government's commitment to the cause of the common consumer is amply reflected in the enactment of *Consumer Protection Act* (*COPRA*), 1986. With the introduction of *COPRA*, the need for evaluating the care being rendered in retrospect has further gained strength. Until now, the quality of health care being provided by the health care organizations could not be subject to critical retrospective evaluation, as there were no checks or controls on the care being rendered and there being no predetermined standards or guidelines in this area. Today, a common consumer expects some sort of assurance that the services rendered should be of desired quality and cost effective.

There is an urgent need to provide guidance to those concerned with quality assurance in hospital services to ensure efficiency and effectiveness of the services rendered. In order to enable them to successfully manage the hospital to fulfil ever rising expectations of the consumer in the present economic scenario, it is imperative that health care professionals should bring in certain standards in their respective areas of work so that quality of health care provided can be evaluated against laid-down norms or standards. Various functionaries, such as doctors, nursing and para-medical staff, hospital administrators, etc, should bear responsibility for any failure in the system, so as to make these services more effective, economical and accountable.

In contrast with the case of products, where the expected performance is often in terms of measurable attributes, the difficulty in case of services is that the customer's needs and expectations are quite often abstract. Notwithstanding this, a hospital keen to provide satisfactory service or to improve upon its present level of service, needs to evolve a suitable mechanism to identify the patient's needs and expectations, even if they are imprecise or vague. This may be done by communication with the users of the service, customer survey, etc. Such attributes, which are important for the patient's needs and requirements, may be picked up. These attributes may be divided into two broad categories:

a) First relating to infrastructure, skills, procedures and systems, etc, which will ensure a satisfactory service at optimum cost. This is a prescription type of provision, adherence to which is expected to result in service of desired quality.

b) The second part comprises identification and quantification, wherever possible, attributes of quality which is a performance based provision. Successful achievement of these quality attributes is expected to provide necessary confidence to hospital management as well as users of these services.

Adopting primary health care and health centres as the principal instrument of action for providing guidelines for planning and managing these services, guidelines have been developed for prescriptive type attributes like infrastructure, skills, manpower, etc, in the following five parts of IS 13808 Quality management for hospital services (up to 30-bedded hospitals) — Guidelines:

Part 1 : 1993	Out-patient department (OPD) and emergency services
Part 2 : 1993	Diagnostic and blood transfusion services
Part 3 : 1995	Wards, nursing services and operation theatre
Part 4 : 1996	Hospital support services
Part 5 : 1996	Hospital equipment management

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

Inspite of great demand, presently there is no guidance readily available on those attributes of quality which are absolutely performance based for hospital services. This standard is intended to fulfil this long felt need. This standard lays down necessary guidelines on the performance requirements of hospital services and the system for their evaluation.

Indian Standard

PERFORMANCE GUIDELINES FOR QUALITY ASSURANCE IN HOSPITAL SERVICES UP TO 30-BEDDED HOSPITALS

1 SCOPE

This standard covers guidelines for performance requirements for services in 30-bedded hospitals and the system for their evaluation.

2 REFERENCES

The Indian Standards given below contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
12433 (Part 1) : 1988	Basic requirements for hospital planning: Part 1 Up to 30-bedded hospitals
13808	Quality management for hospital services (up to 30-bedded hospitals) — Guidelines:
(Part 1) : 1993	Out-patients department (OPD) and emergency services
(Part 2) : 1993	Diagnostic and blood transfusion services
(Part 3) : 1995	Wards, nursing services and operation theatre
(Part 4) : 1996	Hospital support services
(Part 5) : 1996	Hospital equipment management

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Customer

Recipient of the services rendered by hospital/health care organization.

3.2 Service

Result generated by activities at the interface between the hospital/health care organization and the customer and the internal activities of the hospital/health care organization to meet the customers' needs and expectations.

4 GENERAL

4.1 In order to consistently provide the services of desired quality at optimum cost for providing effective and efficient patient-care services, a hospital management should develop, implement and continuously improve the quality management system. Such a system consists of organizational structure, procedures, processes and resources needed to implement the quality management.

4.2 The basic requirements for 30-bedded general hospitals have been clearly defined in terms of infrastructure, personnel, material, etc in IS 12433 (Part 1) which covers the physical facilities required for delivery of service to the patients.

4.3 The service delivery processes for 30-bedded general hospitals have been covered in 5 parts of IS 13808 in respect of OPD and emergency services, diagnostic and blood transfusion services; wards, nursing services and operation theatre; hospital support services and hospital equipment management. Some of the aspects of these quality management system characteristics may not always be observable by the customer, but directly affect service performance.

4.4 The characteristics of hospital services in terms of infrastructure and systems form the starting point. The other set relates to quality considerations which should follow thereafter. These may be quantitative (measurable) or qualitative (comparable). Both these types of characteristics should be evaluated by hospital authorities against defined standards of acceptability. Quality is generally expressed in terms of the following attributes:

a) *Availability* — The services shall be available to the patient whenever needed.

b) *Reliability* — The services shall be accurate and reliable, for example if a blood sample is tested in a pathological laboratory, the values obtained shall be accurate and free from avoidable errors.

c) *Completeness* — The services rendered shall be complete in all respects. If a laboratory test is done for an in-patient but report not sent to the ward, it is not a satisfactory service because it is not complete.

d) *Timeliness* — Rendering the services in time is a very important consideration, which otherwise, may even cost a patient's life. The medical service, in order to be called as good quality or satisfactory, shall adhere to the time specified.

e) *Courtesy* — A hospital service is a highly personalized one and should be rendered with due courtesy and pleasant behaviour to the customer. A patient, while suffering from a disease, heaves a sigh of relief through courteous behaviour.

f) *Economy* — A hospital service should be provided to the patient at reasonable cost which is generally affordable.

g) *Consciousness* — A strong will to redress grievances and make good losses arising out of lapses in service is also an attribute of quality of services rendered.

h) *Other Considerations* — These may include confidentially, hygiene considerations responsiveness, comfort, aesthetics of environment and effective communication and transparency particularly in costs and communications.

5 COMMUNICATION WITH CUSTOMERS

5.1 One of the major indicators of quality of health care services is the feed-back received from patients. It is essential that such feed-back percolates down the line to every employee in the hospital. Another major element in this service area is the concept of consideration. Usually, price is a very important concept in any industry and service. But in health care service area, price has been replaced by the element of consideration. Consideration is price plus loss of dignity, waiting time, anxiety, etc. The latest concept in management is that of customer delight. It has now become essential not only to ensure customer satisfaction but also to aspire for customer delight. Customer delight, for example, means that a receptionist is not merely courteous, but is warm, empathic and well trained in counselling.

5.2 Interface with Customers

5.2.1 Hospital management should establish and monitor effectiveness of interaction between customers and hospital personnel. This is crucial to achieve customer satisfaction.

5.2.2 Management can influence this perception by creating an appropriate image based on the reality of actions taken to meet customer needs. This image presented by personnel at all levels, has a primary effect on the hospital's relationship with the customer.

5.2.3 Personnel having direct customer contact are an important source of information for the ongoing quality improvement process. Management should regularly review the methods used for promoting contacts with customers.

5.2.4 Since health service is mainly people-oriented, prevention and reduction of human errors at all levels are of vital importance. This means that top priority shall be given to human resource development. Some common examples of waste, re-work, negligence and error in patient-care in hospitals are:

a) X-ray/investigation ordered but not done;
b) Prolonged stay before and after the operation;
c) Consultation indicated and not carried out;
d) Wrong label on samples;
e) Wrongly numbered reports;
f) Missing requisitions, reports, etc;
g) Inferior quality of drugs used;
h) Delayed reports;
j) Prescriptions not explained;
k) Medicine prescribed but not given by the nurse; and
m) Incorrect patient identification.

5.3 Communication with customers involves listening to them and keeping them informed. Difficulties in communication or interaction with customers should be given prompt attention. These difficulties provide important information on areas for improvements in the service delivery process. Effective communication with customers involves:

a) Describing the service, its scope, its availability and timeliness of delivery;
b) Stating how much the service will cost;
c) Explaining the interrelationships between service, delivery and cost;
d) Explaining to customers the effect of any problem and how it will be resolved, should it arise;
e) Ensuring that customers are aware of the contribution they can make to service quality;
f) Providing adequate and readily accessible facilities for effective communication; and
g) Determining the relationship between the service offered and the real needs of the customer.

The customers' perception of service quality is acquired often through communication with the service organization's personnel and facilities.

5.4 The control of service and service delivery characteristics should be achieved by controlling the process that delivers the service. Process performance measurement and control are, therefore, essential to achieve and maintain the required service quality.

6 IDENTIFYING RELEVANT INFORMATION AND DATA

6.1 It is important to identify and analyze the relevant information data which may involve:

a) Giving priority to those activities having the greatest adverse impact on service quality;
b) Providing feedback of results of the analysis to operational management with recommendation for immediate service improvement;
c) Reporting periodically to senior management for a management review of long-term quality improvement recommendations; and
d) Admission and discharge analysis of the patients (monthly statistical report).

6.2 Members from different parts of the service organization working together may be able to offer fruitful ideas that could be directed towards improving quality and reducing cost. Management should encourage personnel at all levels to contribute programmes for quality improvement, with recognition for their efforts and participation.

7 PERFORMANCE REQUIREMENTS

7.1 Parameters have to be identified which describe the performance of each activity of the work phase. These parameters should relate to the quality of patient-care activity and should be associated with the appropriate type of service required.

7.2 In order to define standards of acceptable performance, the value of each parameter needs to be specified in terms of both the acceptable level and allowable tolerances.

7.3 Customer's needs and expectations from various activities of hospital services should be kept in mind while laying down various quality parameters. Some of these customer satisfiers are given below:

a) Patients should get cured;
b) Curing should be done in the shortest possible time and at the lowest cost;
c) Cure should be lasting;
d) Psychologically the patients should feel that they are cared for and being treated well;
e) The hospital environment should be clean and inviting;
f) The environment should prevent the spread of diseases to others including doctors, nurses and other patients;
g) Emergencies should be attended to promptly; and
h) Life saving measures should be taken in minimum time.

7.4 Parameters — General Performance

7.4.1 *Reception and Registration*

a) Courteous response,
b) Information provided, and
c) Guidance needed.

7.4.2 *Staff Service*

a) Courtesy,
b) Comfort, and
c) Promptness.

7.4.3 *Housekeeping and Sanitation*

a) Cleanliness and hygiene,
b) Safe and effective disposal of garbage, and
c) Linen and laundering.

7.4.4 *Hospital Infection Control*

Qualitative indicator.

7.4.5 *Patient Management Team*

a) Doctor,
b) Nurse,
c) Para-medicals,
d) Technicians, and
e) Attendants.

7.4.6 *Medical Facilities*

a) ECG,
b) X-ray,
c) Pathological,
d) Sonography (optional),
e) Essential drugs, and
f) Others.

7.4.7 *Other Facilities*

a) Canteen,
b) Laundry,
c) Kitchen,
d) Drinking water,
e) Chemist shop,
f) Waiting space for patient's relatives,
g) Public relation and social work,
h) Horticulture and landscaping,

j) Parking facility,
k) STD/ISD and internet facilities, and
m) Light music/Cable TV.

7.4.8 *Follow-up Care*

7.4.8.1 *Quantitative*

a) Bed occupancy rate,
b) Average length of stay,
c) Hospital death rate,
d) Hospital acquired infection rate,
e) Number of admissions,
f) Number of discharge on non-medical grounds, and
g) Number of LAMA's (Left Against Medical Advice).

7.5 Parameters in Casualty and OPD

7.5.1 *Basic Resuscitation Equipment* — availability of emergency drugs and consumables.

7.5.2 *Time-gap Between Arrival in Emergency Department and Arrangement of Wheel-chair/Trolley along with the Bearer* — least possible time but less than 10 min.

7.5.3 *Escort for Patient* — serious patients, on reaching the casualty, should preferably be provided escort by hospital attendant.

7.5.4 *Receptionist* — should be helpful courteous in providing necessary information and guidance to patients and their relatives and should display identity.

7.5.5 *Waiting Hall* — should be available in well-maintained condition alongwith facilities like toilets, drinking water, telephones, etc.

7.5.6 *Waiting Period Before Being First Seen/Assessed by Doctor/Nurse* — should be least possible time.

7.5.7 *Information of Possible Delays* — Soon after arrival in the waiting hall, patients or their relatives to be informed by receptionist/nursing staff, if there is any likelihood of delay. In addition, the condition of the patient may also be appropriately communicated.

7.5.8 *Waiting Time for Treatment/Advice* — Treatment to be started immediately after being examined by the doctor and this may be modified, if necessary, after receipt of reports of investigation or otherwise.

7.5.9 *Radiological/Laboratory Investigation* — Investigation, requisitioned should be reported upon in least possible time, but it should not take more than 1 h.

7.5.10 *Time Spent in Emergency Department* — Minimum possible time depending on the patient's condition and the work-load in the emergency at a given time, but not more than 2 h before being shifted to minor procedure room or emergency ward for further observation/treatment.

7.5.11 *Adequate Instructions, Oral and Written About Follow-up* — Instructions should be given to the patient about further follow-up treatment/action as per hospital guidelines.

7.5.12 *Opinion Regarding Arrangements in the Emergency Department* — Performance of the emergency department should be certified as satisfactory based on the following parameters:

a) The patient is attended properly and in-time with minimum waiting,
b) Availability of staff and infrastructure as per laid down norms of the hospital,
c) Prompt and efficient handling of the patient for diagnosis and treatment,
d) Lab investigation ordered and facilitated primarily,
e) Patient/Patient's relatives informed regarding condition/management/follow-up requirements, and
f) Courteous and efficient behaviour of every staff of department.

7.5.13 *Dress Code* — All medical and para-medical staff should be wearing proper uniforms.

7.6 Performance Parameters and Norms for In-patient Services Inclusive of Nursing Care Services

7.6.1 *Infrastructure*

Infrastructure for in-patient services inclusive of nursing care should be available as given in IS 12433 (Part 1).

7.6.1.1 *Physical facilities*

a) Patient Holding Area — Availability of space per bed should be according to IS 12433 (Part 1).

   General cleanliness and maintenance should be according to satisfactory level of acceptance so as to prevent any nosocomial infection,

b) Patient Conveniences/Toilets — These should be clean, hygienic and functional,
c) Nursing Station — Nursing station should be maintained in well functioning condition, and
d) Ancillary Room — Ancillary room for doctors, nurses and supporting staff should be well maintained and functional.

7.6.1.2 *Medical instruments and equipment*

Medical instruments and equipment should be available in serviceable condition alongwith maintenance record.

7.6.1.3 *Human resources*

Availability of human resources, namely doctors, nursing staff, supporting staff and others according to IS 12433 (Part 1) should be ensured during working hours.

7.6.2 *Medical Care*

7.6.2.1 *Time of first medical evaluation of patient by the doctor after admission*

It shall be done as soon as possible but not exceeding 1 h. However, initial management should always be advised by the admitting physician, particularly for emergency admissions.

7.6.2.2 *Medical records of provisional clinical diagnosis, investigations requested and management advised and initiated at the time of first evaluation*

Up-to-date medical record should be available at any given time [*see* IS 13808 (Part 3)].

7.6.2.3 *Periodicity of visits of medical staff during the hospitalization of patient*

Periodicity of visits of medical staff shall be at least once a day. It should be in accordance with the type of sickness and its management. Each visit and observations to be recorded in patient's case sheet with date and time.

7.6.2.4 *Behaviour of medical staff*

Behaviour of medical staff with patient and employees shall be communicative, sympathetic and courteous. Continuous evaluation of patient's satisfaction, through exit opinion poll and employees' interpersonal relationship (*see* Annex A) shall be carried out.

7.6.3 *Nursing Care*

7.6.3.1 *Reception of patient in the ward*

Patient shall be received with courtesy and warmth. All documentation including patient's consent (*see* Annex B) shall be carried out as per hospital Standard Operative Procedure (SOP). Freshly prepared bed shall be made available to the patient immediately on arrival in the ward but not later than 15 min. The patient shall be made comfortable.

7.6.3.2 *Administration of oral/parental drugs*

It shall be administered as per schedule and prescription of medical staff and proper records shall be maintained.

7.6.3.3 *Organization of diagnostic investigation*

Timely and proper collection of samples for investigation, their transportation to respective laboratories, receiving and filing the reports in respective patient's medical record should be ensured.

7.6.3.4 *Monitoring of vitals*

Monitoring of vital parameters of the patient shall be done routinely, at least every 8 h or as per medical advice. This shall be recorded simultaneously.

7.6.3.5 *Monitoring fluid levels*

Record of I. V. fluid administration and, where advised, intake and output charts shall be maintained and available.

7.6.3.6 *Basic nursing procedures*

It shall be ensured as per laid down norms.

7.6.3.7 *Supervision of support service staff*

Support service staff attached to the ward should be properly scheduled and supervised so as to meet patient care needs in the ward. This should be monitored through duty rosters and staff movement records.

7.6.3.8 *Behaviour of nursing staff*

Nursing staff should be courteous, helpful and sympathetic to the patients' needs. Continuous evaluation of patient's satisfaction through exit opinion poll and employees' interpersonal relationship (*see* Annex A) should be carried out.

7.6.3.9 *Maintenance of nursing record*

It should be maintained as per standard protocol.

7.6.4 *Ancillary Care*

7.6.4.1 *Personal assistance to the patient*

Need based assistance to the patient should be given by appropriate staff and its evaluation should be done in exit-poll analysis (*see* Annex A).

7.6.4.2 *Transportation of patient to other service areas*

It should be safe, comfortable and timely. The nursing staff should monitor the patient's movement records and services received.

7.6.4.3 *Provision of appropriate linen*

Linen should be changed at least thrice a week.

7.6.4.4 *Provision of diet*

Diet should be in accordance with therapeutic advise, as per time schedule and served in a pleasant and courteous manner. Continuous evaluation of patient's satisfaction through exit opinion poll should be carried out.

7.6.4.5 *Security and safety*

Security and safety of patients and staff should be ensured by hospital administration. The safety and security implies physical safety and safety of property of patient and hospital and it should be ensured as per laid down procedures.

7.6.4.6 *Storage and serviceability*

The provision for storage and serviceability of essential equipments and essential drugs should be done as per laid down procedures. It should be monitored as per the patient drug-administration record and service-record of equipments/ledgers.

7.6.4.7 *Attitude of supporting care staff*

It should be courteous, helpful and sympathetic to the patient's need.

7.7 Performance Parameters and Norms for Diagnostic Services

Diagnostic services in a 30-bedded hospital generally covers the following:

7.7.1 *Lab Diagnostic Service*

a) *Information, registration and receipt of samples* — Least possible time to be taken for information, identification, registration and labelling of samples. It should generally take 3 to 5 min.

b) *Storage and transport of sample(s)* — Appropriate storage and transport of samples of blood, urine, tissues, body fluids, etc, should be done according to Standard Operating Procedures (SOPs).

c) *Time taken to process the samples* — It should vary from half-an-hour to one hour depending upon the type of investigation.

d) *Despatch of report(s)* — Immediate despatch facilities for emergency cases should be available. Despatch facilities for routine cases should be available on the same way.

e) *Numbers of samples tested* — 25 to 30 samples of varied spectrum per day.

f) *Number and spectrum of investigations* — 80 to 120 investigation of varied spectrum.

g) *Technique(s) used for investigation* — Availability and compliance of Standard Operating Procedure (SOP) manual, conventional method or semi/fully automated technique used should be mentioned.

h) *Quality control of investigation* — Internal quality control by testing known value samples alongwith test samples should be done every day and recorded.

j) *Recording of report of investigations and indexing* — A proper record of all investigation reports should be maintained and indexed in specified registers.

k) *Emergency laboratory services* — Availability of restricted emergency laboratory services beyond routine sample collection time is desirable.

m) *General cleanliness in laboratory and disposal of laboratory wastes* — General instructions of cleanliness should be followed. Laboratory wastes should be disposed off properly according to SOP of the hospital.

n) *Specific improvement and up-gradation of laboratory services* — Proposals for up-gradation of techniques/instruments shall be placed to competent authorities periodically, as and when required.

7.7.2 *Imaging Diagnostic Service*

a) *Information, receipt of requisition and registration* — Time required for information, receipt of requisition and registration should be done promptly and should be less than 10 min for each patient. Relevant information should be prominently displayed bilingually (English and local language).

b) *Number of radiographs/ultrasound* — Number of X-ray/ultrasound investigations should be generally between 15 to 20 per day.

c) *Record of utilization of radiographic films* — Proper record of utilization of radiographic films should be maintained. This should also include a record of over-exposed/under-exposed or repeat films for each case.

d) *Radiation protective devices* — Proper use of radiation protection devices should be ensured for the staff as well as patients.

e) *Record of exposure counter reading for X-ray tube* — Record of exposure counter reading of X-ray tube should be properly monitored with a view to planning preventive maintenance of the machine as per manufacturer's instruction/manual.

f) *Fixing and developing of X-ray films* — Fixing and developing of X-ray films should be done according to laid down procedure.

g) *Reporting and despatching of X-ray reports* — The time required for reporting and despatching of X-ray reports should be less than 1 h for emergency cases and within the same day for routine cases.

7.7.3 *ECG Service*

a) *Receipt of ECG demand and registration* — Time required for receipt and registration of ECG demand should be less than 5 min.

b) *Recording, reporting and despatch of ECG reports* — Time for each ECG procedure should be less than 10 min.

c) *Maintenance of ECG machine record* — History sheet of ECG machine should be maintained and available.

7.7.4 *Blood Transfusion Service*

a) *Information, receipt of demand and registration for requisition of blood demand* — The availability of appropriate and adequate information should be ensured. Receipt of demand and registration for requisition of blood demand should be done within 10 min.

b) *Selection of donor* — Selection of donor should be done according to the notified criterion for selection of blood donors. These criteria should be available. The entire selection procedure should take less than 30 min.

c) *Collection, grouping and cross-matching of blood* — This should be done within 45 min following the laid down procedure in Standard Operative Procedure (SOP) manual.

d) *Screening of blood donor for safety measures* — Screening of blood donor for safety measures for testing Hepatitis B, V.D.R.L., HIV and Malaria should be completed in less than 1 h.

e) *Functioning blood storage facilities from blood collection to blood transfusion* — Storage cabinet of minimum 10 bags capacity should be available. Blood bags collected should be transported to the blood bank facility within 2 h. Blood should be stored in the blood bank refrigerator and should be used within the time specified according to Standard Operative Procedure (SOP).

f) *Issue procedure* — Blood should be issued within 10 min after appropriate cross-matching. However, issue of blood should not take more than 1 h after receipt of requisition of initial demand.

g) *Maintenance of record of blood transfusion services* — Availability of complete record of entry of donors, number of issues of cross-matched blood and mandatory investigation records from medico-legal and licensing point of view, should be ensured.

7.8 Parameters in Support Services

7.8.1 *Central Sterile Supply Department (CSSD)*

If a hospital is having CSSD then it should meet the following parameters:

a) *Transportation of articles to CSSD from various user departments* — Appropriate containers and trolleys for transportation should be available.

b) *Receipts* — A registration counter shall be available for receipt of the non-sterile material. Staff shall be available for the receipt of the items. Receipt of material shall be recorded and counterfoil of indent books to be maintained.

c) *Rinsing and cleaning of articles* — Washing taps, sinks, antiseptic/disinfectants and detergent solutions shall be available.

d) *Drying, packing and labelling* — Physical facilities for packing and labelling shall be available. Availability of appropriate packing material for wrapping and labelling of material should be ensured. Physical checking of individual packages/trays as per norms to be ensured.

e) *Methods for sterilization — Steam sterilization* — The following shall be ensured:

   1) Functioning of autoclave,
   2) Checking of temperature and holding time,
   3) Availability of colour tapes, and
   4) Charts and records are maintained manually.

f) *Maintenance of equipment* — The following shall be ensured:

   1) Preventing action is taken for maintenance of equipment,
   2) Spare parts are available,
   3) Break down maintenance is carried out, and
   4) Periodic check up of the equipments is regularly performed.

g) *Storage and issue of sterilized material* — Space for sterile material is earmarked and made available. Physical facilities such as racks with air cool/AC arrangements are available. Space for issue counter is also available.

h) *Quality control* — The following shall be ensured for Quality Control Maintenance:

1) Intactness of wrappers over sterile supplies;
2) Records of temperature, pressure and holding time are maintained;
3) Heat sensitive tapes and Bacillus sterothermophilus culture tubes are available and used;
4) Records of random sampling sterile items for culture to be maintained; and
5) Availability of SOP and its follow up with periodical amendments shall be ensured.

7.8.2 *House Keeping and Maintenance Services*

7.8.2.1 *Waste management*

Availability of the following shall be ensured:

a) Guidelines for hospital waste management issued by Government of India, with periodical amendments.
b) Segregation, collection, transportation, storage, treatment and disposal.
    1) Colour code for the waste segregation and disposal to be followed.
    2) Segregation at its site of generation to be collected in prescribed bags/ containers. Special care shall be taken to separate hazardous waste from non-hazardous waste.
    3) Transportation in covered trolleys/bags.
    4) Stored in a secured place and out of reach from the animals, rodents, pests and rag-pickers
    5) Treatment of hazardous/infected waste prior to disposal.
    6) Disposal of waste as per the classification. The hazardous/infected waste shall be disposed by incineration or any other acceptable scientific methods.
c) Needles and sharps are blunted and collected separately in hard sturdy (puncture proof) containers after treatment with hypochlorite solution.
d) Proper documentation and maintenance of records.
e) Appropriate protection and safety precautions for personnel handling the waste.

7.8.2.2 *Sanitation and hygiene*

Sanitation and hygiene of the hospital premises and various function areas shall be ensured by the following:

a) Frequent and scheduled cleaning of various hospital areas including toilets, washbasin, pantry, etc, with copius amount of water.
b) Adequate water supply, cleaning materials including brooms, mops, detergents, chemicals, stain removers, deodorants, etc.
c) Application of various methods of cleaning as per functional requirement of patient-care and other areas such as sweeping, dusting, moping, waxing, stain removing, scrubbing and vacuum cleaning.
d) Active supervision of the various sanitation and hygiene activity including documentation and record keeping.

7.8.2.3 *Maintenance function*

Regular cleaning, positioning and maintenance of all the equipment including maintenance of a log-book for the same shall be ensured.

Preventive maintenance of equipment including furniture and fixtures, doors, lifts, trolleys, etc, shall also be ensured.

7.8.2.4 *Safety and security function*

The following shall be ensured:

a) Standing security procedures are being followed;
b) Safety code including fire safety are given to all concerned;
c) Fire procedures and policies are ready with housekeeping department at any given time and staff concerned must know what to do, how to operate the equipments in any emergency;
d) Fire regulations are permanently posted;
e) 'NO SMOKING' signs are permanently pasted;
f) Ensure the proper upkeep of the fire fighting equipment; and
g) Fire fighting drill is carried out periodically.

7.8.2.5 *Rodent and pest control*

Ensured that pest control measures are being followed.

7.8.2.6 *Linen management*

The following shall be ensured:

a) Linen is changed at regular interval and at least once a day,
b) Clean linen is available at any time and every time, and

c) Co-ordination is being maintained with laundry services.

7.8.2.7 *Horticulture and landscaping*

The following shall be ensured:

a) Hospital premises is cleaned regularly,

b) Proper horticulture and landscaping are made available by adequate plantation of trees and seasonal plants, and

c) Adequate open space for parking be made available.

7.8.2.8 *Procedure manual*

The following shall be ensured:

a) Availability of SOP with complete guidelines for day-to-day working and exigency situations to the working personnel;

b) Periodical training schedule to the personnel;

c) All the personnel should follow the universal precaution procedures while cleaning and handling the wastes;

d) Availability of equipment maintenance record; and

e) Availability of entire inventories, receipts and issue records.

7.8.3 *Hospital Dietary Services*

a) *Location* — Availability of the following shall be ensured:

  1) Accessible and hygienic location; and

  2) Availability of physical infrastructure, equipment and trained manpower as per IS 12433 (Part 1).

b) *Demand estimation, selection and procurement of the kitchen stores* — Check the following:

  1) Quantity and quality of raw material,

  2) Availability of proper requisition slip/ format,

  3) Diet requisition originating from various wards is in prescribed format containing details of therapeutic and general diet, and

  4) Dietary store purchase committee.

c) *Receipt, storage, preservation and issue* — Ensure the following:

  1) Receipt and inspection of perishable and non-perishable stores;

  2) Adequate storage space;

  3) Proper storage facilities for perishable and non-perishable dietary items in terms of adequate space, proper lighting, ventilation and humidity control so as to ensure preservation of food values;

  4) Pest and rodent control;

  5) Principle of first in first out (FIFO) for issuance of material;

  6) Maintenance of stock registers and other documentation; and

  7) Issue of ration to the preparation area as per diet demand received from in-patient areas (Wards).

d) *Maintenance of kitchen appliances* — Ensure timely preventive maintenance and repairs.

e) *Preparation of food* — Check if the preparation of food is being carried out:

  1) as per prescribed diet scale.

  2) as per menu planning.

  3) under hygienic conditions.

  4) by preserving food values — calorie requirement.

  5) within the time schedule.

f) *Distribution of food* — Ensure the following:

  1) Food is properly covered,

  2) Distribution is done under appropriate temperature and palatable state,

  3) Right quantity of the food is distributed to right person at right time, and

  4) Courteous behaviour of the person distributing the food.

g) *Disposal of refuge and waste* — Ensure timely collection and safe disposal of dietary waste.

h) *Patient satisfaction* — Ensure patient feedback system in appropriate proforma for improving patient satisfaction on regular basis (*see* Annex B).

7.8.4 *Linen and Laundry Services*

a) *Total sets of linen* — There should be at least four sets of linen/bed, eventhough six sets are preferable.

b) *Number of changes* — Number of changes of linen are recommended as below:

Patient linen :	Body linen — daily
	Bed linen — daily/ alternate days
Staff linen :	OT and critical care areas — daily
	Other areas — weekly

Other departmental linen : Fortnightly

c) *Collection of linen* — Linen to be sent for the laundering must be segregated at the level of the generation and this should be done as per the following categories:

   1) *Contaminated/infected linen* — It should be removed from patient-care area and disinfected before sending to laundry. It should be packed in eco-friendly red polythene bags;
   2) *Soiled and fowl linen* — It should be cleaned, washed and packed in yellow eco-friendly polythene bags before sending to laundry, and
   3) *Dirty linen* — It should be packed in black eco-friendly polythene bags before sending to laundry.

d) *Transportation of linen* — All categories of bags should be transported through trolley or manually everyday to the laundry. The quantity transported should be accounted for through a proforma/register.

e) *Receipt* — Ensure that mentioned quantity is received and documented.

f) *Laundering process*

   1) Ensure that the various categories of linen received in the laundry are processed as per the standard process that is sorting, sluicing, washing, drying and storing.
   2) Laundry should have regular and adequate supply of water along with the following consumables per 100 kg of wet linen:

Detergent	1.2 kg
Soda ash	2.0 kg
Bleaching powder	0.5 kg
Blue	30-50 g
Whitener	30-50 g
Starch/softener	as per requirement

g) *Issue* — Ensure issue of linen as per the demand of working area and it should be accounted for.

h) *Maintenance of equipment* — Ensure corrective and preventive maintenance of equipment as per hospital equipment maintenance norms.

j) *Linen control and quality assurance* — An official should be designated for linen control and its quality assurance.

7.8.5 *Transport Services*

To have a functional transport service for the hospital, the hospital should meet the following parameters:

a) *Type and number of transport* — Hospital should have following types of transport vehicles. The nature of vehicle can be decided upon rural/urban, trained etc:

   1) Ambulance: 1
   2) Multi-utility transport vehicle: At least 1

b) *Trained drivers* — Each vehicle should have a trained and licensed driver. The driver should be given training in first-aid. Ambulance/any heavy vehicle should have a attendant/cleaner and he should also be given training in first-aid.

c) *Supervision* — A responsible officer of the hospital should be given additional responsibility/charge of the transport services. He would also be responsible for making arrangement for maintenance and repair services with in and outside the hospital.

c) *Preventive maintenance* — Inspection at regular specified intervals should be carried out for every vehicle. For ensuring the same following aspects are to be ensured:

   1) *Daily maintenance*:
      - Check petrol/diesel, oil, water level, etc, and inspect for any leakage anywhere;
      - Check battery water, air cleaners for tightness, fan belt, tyre pressure and condition, clutch, brake pedal, lights and dynamo charging, etc;
      - Completely clean the vehicle from inside and outside; and
      - Check tools.
   2) *Weekly maintenance*:
      - Wash the vehicle thoroughly;
      - Check and attend coiling system, fuel system, lubricant system, exhaust and silencer system;
      - Check all the wheels for proper alignment and adjustment;
      - Check tyres for abnormal wear and tear;
      - Remove battery. Clean and top up, clean the terminals and apply mineral jelly;
      - Remove air cleaners and clean it; and
      - Check body holding bolts, springs, clamps, shackle bolts, gear box, petrol tank, radiator, etc.

e) *Maintenance of log-books* — Log-book summary report for a month should be prepared and submitted to in-charge. It should contain following details:

1) Type of vehicle with registration number;
2) Date of servicing, servicing done by;
3) Kilometres remaining at the beginning of month;
4) Kilometres remaining at the end of the month;
5) Total kilometres covered during the month;
6) Balance of petrol/diesel of last month;
7) Petrol/diesel purchased, consumed and balance at end of the month;
8) Engine oil, gear oil, grease purchased during month;
9) Average kilometres per litre of petrol/diesel;
10) Number of days worked during the month;
11) Name of driver; and
12 Name of officer and signature.

Entries should be made on day-to-day basis and should be verified at the end of month by competent authority.

f) *Vehicle breakdown report* — The following shall be recorded in a register for every breakdown:
    1) Vehicle number, kilometre reading;
    2) Description of breakdown, how it happened;
    3) Have the defect rectified and by whom, details of spares, labour, etc;
    4) Date of breakdown, date of repair;
    5) Number of days out of service; and
    6) Signature and designation.
g) *Quality control* — The following quality control measures shall be ensured:
    1) Availability of vehicles during requirement,
    2) Number of days in a month the vehicles are off the road (to be calculated individually for each vehicle),
    3) Number of times a vehicle is required to sent for repair and maintenance other then routine servicing,
    4) Availability of the drivers in time, and
    5) Training of the drivers in handling of the patients during transportation.

7.8.6 *Equipment Management*

In order to establish an effective, economical and accountable equipment management, the following shall be ensured:

a) *Planning of equipment* — As per identified list of equipments for 30-bedded hospitals given in IS 12433 (Part 1).
b) *Procurement* — A cost effective and scientific system be followed such as specifications with terms and conditions suitable to the organization and to the best of its uses.
c) *Utilization of equipment*

    Physical availability of each functioning and non-functioning equipment in respective usage area shall be ensured.

    1) Output record of each equipment shall be endorsed in respective register as per the format.
    2) Number of hours an instrument functioning per day shall be asset by using 'Use coefficient' formula as given below:

        Use coefficient = $N/M \times 100$

        where

        N = Average number of hours instrument functioning per day, and

        M = Maximum number of hours the instrument can be used per day.

        Less than 50 percent, use coefficient indicates under utilization of equipment. However, this is not applicable to life saving equipment.
    3) Costly and hi-tech equipment should be handled by trained personnel.
d) *Repair and maintenance* — The following shall be ensured:
    1) Establishment of a scientific system of repair and maintenance.
    2) Regular and preventive maintenance by user on day-to-day basis.
    3) Annual maintenance contract by an authorized agency of the company/supplier.
    4) In-house facility for maintenance and repair for minor breakdowns.
e) *Condemnation and disposal*
    1) Identified equipment beyond economical repair, obsolete, non-functional, hazards.
    2) Constitute a committee to find ways and means for disposal of such equipments.
f) *Equipment audit* — Wherever applicable equipment audit be carried out with respect

to equipment use coefficient, performance, break even analysis, breakdown/downtime, cost on repair and maintenance, availability of consumable (reagents and kids) and operational safety and quality of its performance.

7.8.7 *Hospital Supply System (Stores)*

To have an efficient hospital supply system (stores), the hospitals should meet the following parameters:

a) *Types of store items*:

   Hospital should have availability of following three categories of stores:

   1) *Medical stores* — Drugs, vaccines and contraceptives, lab chemicals and kits,
   2) *Surgical stores* (including instruments):
      i) Expandable, and
      ii) Non-expandable.
   3) *General stores* — Stationery, furniture, linen and other items.

b) *Demand estimation* — Availability of Committee to look into matters of preparation and time-to-time update of hospital drug formulary which is based upon morbidity pattern and consumption rate, shall be ensured.

c) *Procurement of store items* — The following shall be ensured:

   1) All the procurement procedure to be done under the supervision of a Committee (Store purchase).
   2) One of the Medical Officer should be made in-charge of all the procurement procedures.
   3) All the items to be procured should be from the formulary only.
   4) The demand for each item alongwith its quantity should be initiated by the respective user departments.
   5) Procurement of the items should be done as per the laid down rules of Government of India, that is:
      — Tender system;
      — Rate contract;
      — Authorized manufacturers (Public sector firms);
      — Authorized agencies (MSD, MSO, Super bazaar); and
      — Local purchase (in case of emergencies).

d) *Receipt and inspection* — The authorized person only should receive the supply for the hospital. On receipt of each item same should be inspected thoroughly, whether they are supplied as per the specifications and having the mandatory Quality Control Certificate attached alongwith. The inspection should be done on following lines:

   1) *Physical verification*:
      — Quantity (that is exact number asked for);
      — Physical appearance (colour, shape, consistency, etc);
      — Hardness and dispensability (for tablets);
      — Turbidity or any suspended particles (for all injectables); and
      — Validity considering date of manufacturing/expiry.
   2) *Chemical analysis* — 10 percent of random stores item to be sent for chemical analysis to authorized labs for certification within 15 days.

e) *Storage* — The following shall be ensured:

   1) Maintenance by proper authorized person(s) having sufficient experience of dispensing of drugs.
   2) Order of arrangements of items for storage and dispersing as per norms.
   3) Maintenance of registers/records pertaining to procurement, storage and distribution of items. These registers are to be maintained very meticulously and supervised at a regular interval by the competent authorities. Out of these the following registers are must:
      — Stock registers,
      — Expiry drug registers, and
      — Narcotic drug registers, etc.
   4) Conduction of physical verification of items at regular interval at least of vital and essential items.
   5) Lead-time should be known before hand and to be followed strictly so that there should not be any stock outs.
   6) Reorder level (once a year) to be calculated properly and to be applied in regular procurement of the items.

7) Buffer stock to be worked out properly applying the inventory control techniques/scientific techniques and to be followed strictly.

f) *Condemnation and disposal of items* — Condemnation and disposal of non-consumable surgical instruments shall be conducted through Condemnation Committee. This procedure shall be carried out at regular intervals, at least once a year.

g) *Quality control* — The following Quality Control parameters shall be checked regularly:

1) Number of times the items are available when asked for;
2) Delay on procurement of items, over and above the normal lead time;
3) Number of items rejected after quality analysis/labelled supervision or substandard;
4) Delay in getting the results of chemical analysis;
5) Amount of items/drugs getting time expired;
6) Amount of items/drugs wasted/damaged due to pilferage, spoiled, etc; and
7) Number of times physical verification at regular interval occurred or not.

8 APPLICATION OF STATISTICAL METHODS

Modern statistical methods can assist in most aspects of data collection and application, whether it be to gain a better understanding of customer needs, in process control, capability study, forecasting, measurement of quality to assist in making decisions or continuous improvement in quality of service.

Few examples are given below:

a) Seven quality control tools can be applied, for example, if a patient does not respond to a particular line of treatment, a team of doctors could carry out a cause-and-effect analysis of the problem and work out a more effective treatment instead of relying on experimentation or intuition or expertize of one doctor.

b) Trend charts can be prepared for average time required to cure a disease to see any continuous improvement; number of patients treated per month.

ANNEX A

(*Clauses* 7.6.2.4, 7.6.3.8 *and* 7.6.4.1)

EXIT INTERVIEW PROFORMA

You may kindly express your frank and honest opinion regarding the experience you had for availing services from this hospital.

Scale in: Good (3), Average (2), Poor (1).

1 Reception and Registration

- a) Promptness in answering questions
- b) Courtesy and politeness
- c) Well-informed/explained replies
- d) Promptness in service

2 Waiting Area

- a) General condition and cleanliness
- b) Setting arrangement
- c) Toilets
- d) Drinking water

3 Doctors

- a) Accessibility
- b) Courteous and sympathetic attitude
- c) Listened and explained properly
- d) Punctuality/Availability
- e) Helpful with quarries

4 Pharmacy Services

- a) Promptness in service
- b) Explanation of prescription
- c) Helpful and well informed replies
- d) Availability/Quality of medicines

5 Diagnostic Services

- a) Primitiveness in services
- b) Courtesy and politeness
- c) Explanation of procedures
- d) Helpful in answering

6 Admission and Registration

- a) Courtesy and politeness
- b) Explanation of procedures/forms
- c) Promptness in admission process

7 Indoor Services

- a) Cleanliness of room
- b) Cleanliness and maintenance of toilets
- c) Quickness
- d) Condition of bed and linen
- e) General comfort
- f) Availability of medicines

8 Nursing Services

- a) Courtesy and sympathetic attitude
- b) Smiling and pleasant when talk to
- c) Promptness when called
- d) Punctuality in giving medicine, injection, etc
- e) Competence

9 Dietary Services

- a) Timely services
- b) Palatability

10 Other Support Staff

- a) Ward boy
- b) Dressers
- c) Physiotherapist
- d) Medico-social worker
- e) Safai karamchari

11 Ancillary Services

- a) House keeping
- b) Security
- c) Water
- d) Electricity
- e) Maintenance

12 Discharge Procedures

- a) Promptness in discharge process
- b) Directions about home care

13 Additional Comments/Suggestions

14 Overall Rating

15 Identify of the Patient (Optional)

- a) Name:
- b) Age/Sex:
- c) C.R. No.:
- d) Address:
- e) Signature:

ANNEX B

(*Clause* 7.6.3.1)

CONSENT FORM

C.R.No./O.P.D. No. ....

Name .... Sex .... Age ....

Son/Daughter/Wife of ....

Address ....

....

Insured Consent

Authorization for Medical Treatment, Administration of Anesthesia and performance of Surgical Operation and/or Diagnostic/ Therapeutic Procedure.

1 I hereby authorize .... hospital to perform upon .... the following medical treatment surgical operation and/or diagnostic/ therapeutic procedures ....

2 It has been explained to me that, during the course of the operation/procedure, unforeseen conditions may be revealed or encountered which necessitate surgical or other emergency procedures in addition to or different from those contemplated at the time of initial diagnosis. I therefore, further authorize the above designated medical official to perform such additional surgical or other procedures as they deem necessary or desirable.

3 I consent to the administration of a anesthesia and to use such anesthetics as may be deemed necessary or desirable, except to the following exceptions:

....

(Indicate exception or 'None')

4 I state that I am/am not suffering from Hypertension/Diabetes/Bleeding disorders/Heart diseases or ....

5 I also state that I am not suffering from any known allergies or drug reactions.

6 I further consent to the administration of such drugs, infusions, plasma or blood transfusions or any other treatment or procedures deemed necessary.

7 The nature and purpose of the operation and/or procedures, the necessity, thereof, the possible alternative methods, treatment, prognosis, the risks involved and the possibility of complications in the investigative procedures/investigations and treatment of my condition/diagnosis have been fully explained to me and I understand the same.

8 I have been given an opportunity to ask all/any questions and I have also been given option to ask for any second opinion.

9 I acknowledge that no guarantee and promises has been made to me concerning the result of any procedure/treatment.

10 I consent to the photographing or televising of the operations of procedures to be performed, including appropriate portions of my body, for medical, scientific or educational purposes, provided my identity is not revealed by the pictures or by descriptive texts accompanying them.

11 For the purpose of advancing medical education, I hereby give consent to the admittance of observers to the operating room.

12 I also give consent to the disposal by hospital authorities of any tissues or parts which may be removed during the course of operative procedure/treatment.

I certify that the statements made in the above consent letter have been read over and explained to me in my mother tongue and I have fully understood the implications of the above consent and further submit that statements therein referred to were filled in and any inapplicable paragraphs stricken off before I signed/put my thumb impression.

Signature of patient/Thumb impression

Date Name

Signature, names and address of the witnesses:

1. .... 2. ....

....

When patient is a minor or unable to affix signature due to mental or physical disability.

Signature/Thumb impression of natural guardian/guardian

Name and relationship with patient

Signature, names and address of witnesses:

1. .... 2. ....

....

I confirm that I have explained the nature and effects of the operation/treatment to the person who has signed the above consent form.

Signature of Doctor-in-Charge

Name

Date Designation

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Hospital and Medical Care Services Sectional Committee, MSD 8

Organization	*Representative(s)*
Safdarjung Hospital, New Delhi	Dr V. H. Talib (**Chairman**)
All India Institute of Medical Sciences (AIIMS), New Delhi	Dr R. K. Sarma Dr D. K. Sharma (*Alternate*)
All India Occupational Therapists' Association, New Delhi	Dr R. K. Sharma Dr Anil Srivastava (*Alternate*)
Armed Forces Medical College, Pune	Lt-Col R. K. Bhaskar
B. M. Birla Heart Research Centre, Kolkata	Shri Amit Dey
Cauvery Medical Centre, Bangalore	Dr G. D. Kunder
Commissionerate of Health, Medical Services and Medical Education, Gandhi Nagar	Dr K. C. Mehta
Directorate General of Health Services, New Delhi	Dr K. B. Logani Dr V. K. Sinha (*Alternate*)
Directorate of Health and Family Welfare, New Delhi	Shri Dilip Kumar
Directorate of Health Services, Chandigarh	Director
Directorate of Health Services, Gujarat	Director
Directorate of Health Services, Mumbai	Dr Subhash R. Salunke Dr Ram S. Bharuka (*Alternate*)
Escorts Heart Institute and Research Centre (EHIRC), New Delhi	Dr (Shrimati) Anita Arora
Hospital Services Consultancy Corporation (India) Limited, New Delhi	Shri Sanjiv Sood Shri V. S. Krishnan (*Alternate*)
Indira Gandhi National Open University (IGNOU) School of Health Sciences, New Delhi	Prof A. K. Agarwal
Indian Hospital Association, New Delhi	Dr S. D. Vohra
Indian Medical Association, New Delhi	Dr Ketan Desai Dr Sanjeev Malik (*Alternate*)
Indian Society of Health Administrators (ISHA), Bangalore	Dr Ashok Sahni
INMAS, New Delhi	Brig J. K. Bansal Lt-Col G. Khoshoo (*Alternate*)
Jaipur Golden Hospital, New Delhi	Superintendent
JIPMER Medical College, Pondicherry	Director Head of Department of Anesthesiology (*Alternate* I) Head of Radio-diagnosis (*Alternate* II)
Medical Council of India, New Delhi	Dr K. K. Arora
Ministry of Defence, New Delhi	Col H. S. Gularia Lt-Col S. C. Acharya (*Alternate*)

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Organization	*Representative(s)*
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Ordnance Factory Board, Kolkata	Director Additional Director (*Alternate*)
P. D. Hinduja National Hospital and Medical Research Centre, Mumbai	Brig (Retd) Joe Curian Shri Anuran Verma (*Alternate*)
Post-Graduate Institute of Medical Education and Research (PGI), Chandigarh	Dr Anil Narang
Safdarjung Hospital, New Delhi	Dr Arvind Theogaonkar
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University College of Medical Sciences and Guru Tegh Bahadur Hospital, Delhi	Dr S. Dwivedi
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Director of Health Services (DHS), New Delhi	Dr Suresh Seth Dr Ramesh Chugh (*Alternate*)
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Municipal Corporation of Delhi, Delhi	Dr K. N. Tiwari Dr N. C. Sharma (*Alternate*)
Medical Council of India, New Delhi	Dr K. K. Arora
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Director of Health Scrvices (BHS), New Delhi	Dr J. N. Mohanty

(*Continued on page* 19)

(*Continued from page* 18)

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